Basics of Health Intelligent Data Analysis

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Contents


HEADS
PhD PROGRAMME IN HEALTH DATA SCIENCE

Preface

This is a *book* written in **Markdown** through *RStudio*.

The **bookdown** package (Xie, 2015) can be installed from CRAN or Github:

```
install.packages("bookdown")
# or the development version
# devtools::install_github("rstudio/bookdown")
```

To compile this example to PDF, you need XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.name/tinytex/.

In this *book*, we will present our results for the work we made on the subject of **Basics of Health Intelligent Data Analysis** from the **HEADS** PhD programme.

An exhaustive explanation using the **bookdown** package (Xie, 2019) can be found at bookdown: Authoring Books and Technical Documents with R Markdown and this is only a sample book, which was built on top of R Markdown and **knitr**

Chapter 1

Introduction

A legend from the III century AC bring us Saints Cosmas and Damian, two christian martyrs whom practiced medicine in the region of Aegeae, actual southwest Turkey. They were Anarguroi, reluctant of asking for money and, according to the legend or miracle, they were capable of transplanting the leg of a dead Ethiopian to an amputated Individual. Many years later, 17 centuries after that, at Boston in 1954, Doctor Joseph Murray succeeded in transplanting a kidney to an individual. The transplantation performed by the Southafrican surgeon, Christiaan Barnard in 1967, the first successful heart transplantation ever performed, was probably the one that made transplantation surgery front-page prompting even more longings and promising dreams. Since then, the technique has developed enormously.

Nowadays, organ transplantation is a medical practice performed worldwide. If we take a look at that transplantation cartography it reveals that the distribution of such technique, or clinical practice is deeply unequal. Where economic resources exist where technology is available transplantation surgery is almost routine. However, in many places in the world is simply, and unfortunately, nothing but a dream.

In this study we aim to do a descritive analysis of deceased organ donors used for transplantation in Portugal.

Chapter 2

Methods

Data used in this study was collected from IPST data base the register for organ transplants performed in Portugal. Between 2016 and 2018, a total of 891 deceased organ donors where registered. For each donor data on transplantation date, region, sex, age, height, weight, cause of death, Coordination Transplant Office (CTO) (table 2.1), AB0 blood type, HLA typing, transplanted organs (kidney, heart, lung, leaver and pancreas), kidney transplant unit (TxU) (table 2.2) and diagnosis of death (brain death (BD) or cardiocirculatory death (CD)).

We performed a descriptive analysis in order to summarize deceased organ donors characteristics.

In Portugal we have a total of 5 Coordination Transplant Offices (CTO) responsables for the identification of potential donors, and 8 kidney Transplant Units (TxU) divided by 3 regions.

All the analysis and graphic representations where performed in *RStudio*, an integrated development environment (IDE) for **R** programming language.

Table 2.1: Coordination Transplant Offices

CTO	name	region
CHP	Centro Hospitalar do Porto	North
CHSJ	Centro Hospitalar Sao Joao	North
CHUC	Centro Hospitalar Universidade de Coimbra	Center
CHLC	Centro Hospitalar Lisboa Central	South
CHLN	Centro Hopitalar Lisboa Norte	South

Table 2.2: Kidney Transplant Units

TxU	name	region
CHP	Centro Hospitalar do Porto	North
CHSJ	Centro Hospitalar Sao Joao	North
CHUC	Centro Hospitalar Universidade de Coimbra	Center
CHLC	Centro Hospitalar Lisboa Central	South
CHLN	Centro Hopitalar Lisboa Norte	South
CHLO	Centro Hospitalar Lisboa Norte	South
CVP	Cruz Vermelha Portuguesa	South
HGO	Hospital Garcia de Orta	South

Chapter 3

Results

Between 2016 and 2018, we have a total of 295, 308 and 288 donors resopectively (table **??**)

year	n
2016	295
2017	308
2018	288

3.1 Donors

3.2 Transplants

Chapter 4

Discussion

A discussion about our results.

Chapter 5

Final Words

We have finished a nice book.

Bibliography

Xie, Y. (2015). *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition. ISBN 978-1498716963.

Xie, Y. (2019). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.14.